



*Light for Tomorrow.*





# Leading energy systems transition through our technologies and insights of excellence

## Message from the President

Central Research Institute of Electric Power Industry (CRIEPI) was founded in 1951 to serve as a joint research institute for the electric power industry to contribute to the industry and society through scientific and technological research. Since then, for more than seven decades, we have contributed to the electric power industry from the aspect of R&D which is the pillar of the development of Japanese economy and society.

While the energy policy in Japan is based on S+3E (Safety, Energy Security, Environment, and Economic Efficiency), long-term energy security and decarbonization have arisen as of more imminent importance among all of them. Digitalization with broad applications of artificial intelligence is yet another driver of rapid changes to our society. The key to overcoming these more complex issues in our era of changes is to integrate diverse knowledge and wisdom.

We are challenging to resolve medium- and long-term issues through cross-disciplinary research by a wide range of experts from natural

sciences and engineering to social sciences, with research collaboration with institutions concerned in Japan and abroad. Inheriting the philosophy of CRIEPI's founder, Yasuzaemon Matsunaga; "Industrial research tempers wisdom, and thereby contribute to society", we work sincerely to investigate the principles of things, always keep perspectives of the electric power industry and the society beyond, and produce research results and solutions which effectively lead to social implementation.

Yoshiro Hiraiwa  
President, CRIEPI

## About CRIEPI

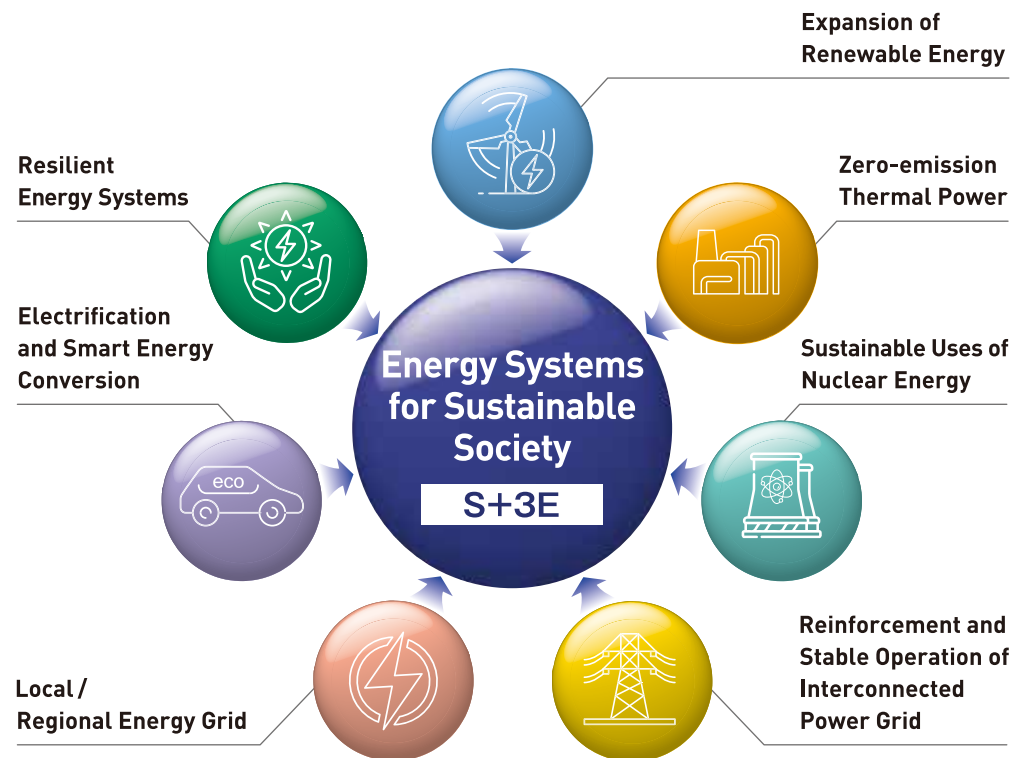
CRIEPI is a central and academic research institution for the electric power industry that supports the transformation of technology and systems pertaining to the supply and use of electric power and other forms of energy, and thus leads technological innovation in the energy industry.



# OUR VISION

The vision that we have developed for Japan in the year 2050 takes into account circumstances affecting our nation, fundamental energy policy perspectives, and the electricity business environment. Our vision seeks to create an “Energy Systems for Sustainable Society”. To realize this, we have set forth seven goals, and promote research and development to achieve these and, by extension, our vision. We will spearhead the transformation of energy systems by providing society with value generated by new technologies and knowledge.

## 7 Goals by 2050



## Research Framework

To attain these seven goals, our Socio-Economic Research Center, Nuclear Risk Research Center, Energy Transformation Research Laboratory, Grid Innovation Research Laboratory, and Sustainable System Research Laboratory collaborate to capitalize on our collective capabilities.

It is our intention to accurately grasp changes taking place in society and the electric power industry, produce research, and apply these results in a practical manner for the benefit of society.

### Socio-Economic Research Center (SERC)

To create a stable and decarbonized energy supply-demand system, the SERC analyzes the contribution of renewable energy, nuclear and thermal power in the energy mix, considering climate change issues, changing energy demand and the design of energy markets.

### Nuclear Risk Research Center (NRRC)

The NRRC assist nuclear operators and the nuclear industry in their continuous effort to improve the safety of nuclear facilities, that is, to manage the relevant risks, by developing and employing modern methods of Probabilistic Risk Assessment (PRA), risk-informed decision making and risk communication.

### Energy Transformation Research Laboratory (EXRL)

The EXRL promotes the development of innovative technologies to convert and store energy, the long-term use of nuclear power plants, the development of next-generation nuclear reactors, and the realization of zero-emission thermal power generation.

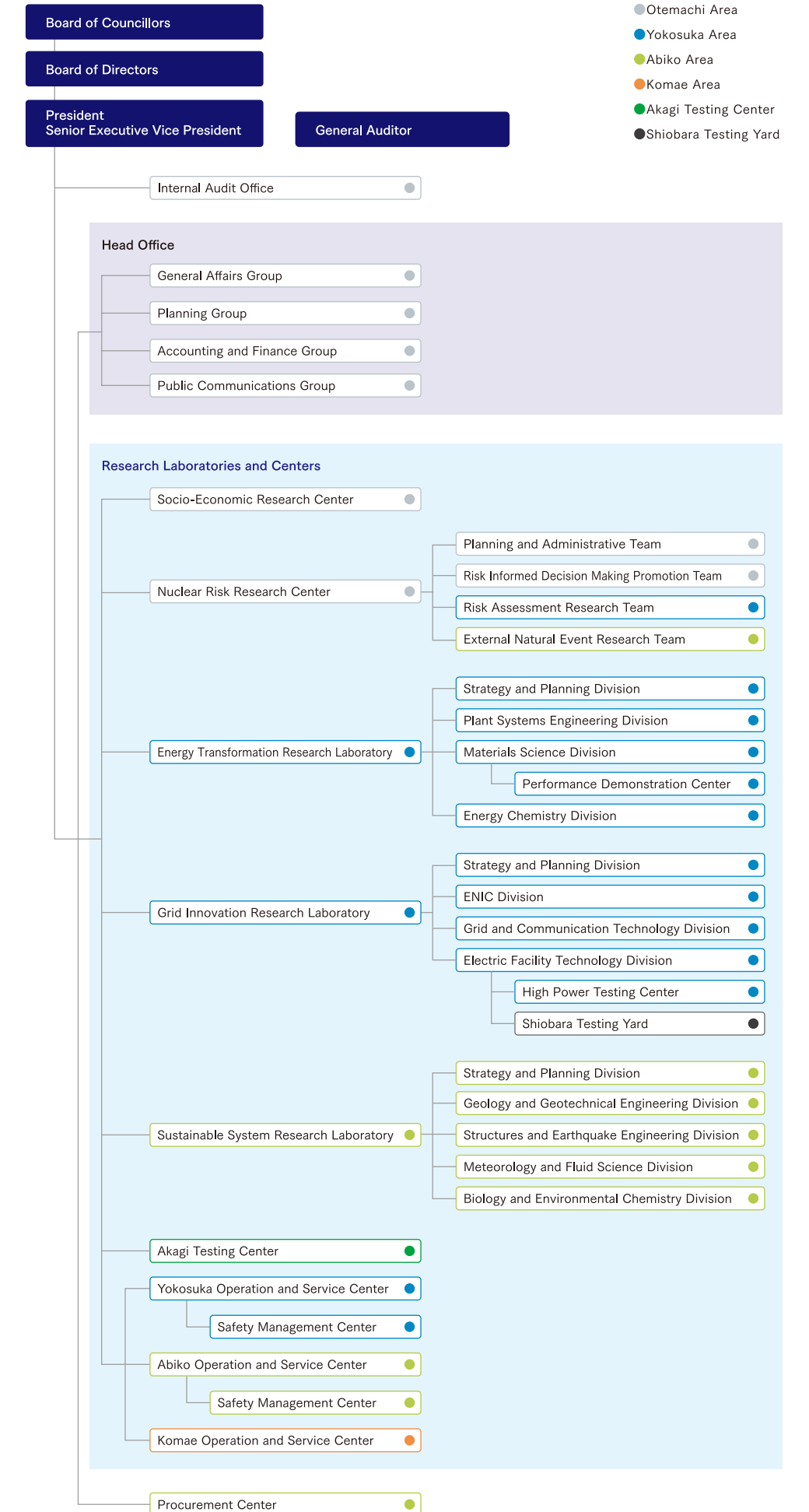
### Grid Innovation Research Laboratory (GdRL)

The GdRL promotes research and development that contributes to the building of new wide-area systems and regional energy supply-demand infrastructure and to electrification in the industry, transport and household domains in order to simultaneously facilitate increases in renewable energy and its guaranteed supply.

### Sustainable System Research Laboratory (SSRL)

The SSRL promotes research and development pertaining to the reinforcement of resilience through effective disaster risk prevention, operation and preservation for electric power equipment, the construction, operation and preservation of renewable energy power source equipment for the likes of offshore wind power generation, the disposal of radioactive waste, and radiation safety.

## Organization





# CORPORATE PROFILE

## Overview

Ordinary Revenue  
(FY2023 financial statement)

¥31.6 billion

Personnel (FY2023)

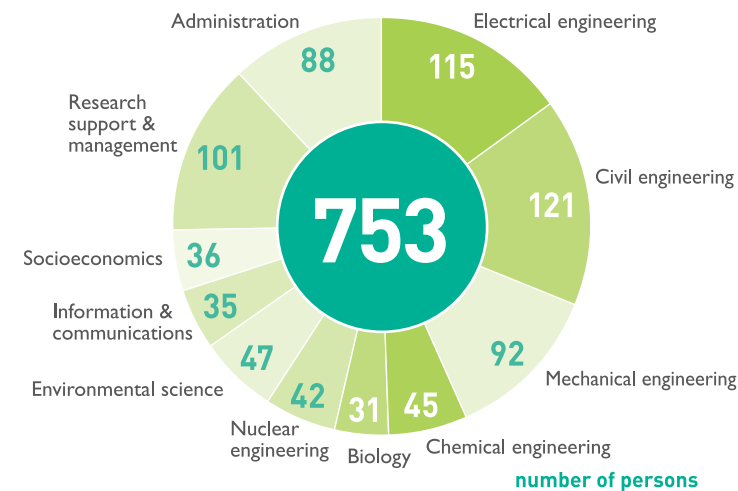
753

Research : 665

Staff with  
doctorate degrees 390

Administration : 88

### Personnel Configuration by Subject Field



## Research Results / Intellectual Property (FY2023)

Research Reports

484

Presented Papers

1,346

Academic Papers  
(peer reviewed)

466

Patents  
Application

45

Registration

42

Software

107

## Research Network

With the aim of identifying trends in forefront energy-related R&D, CRIEPI proactively engages in exchanging with domestic and international partners possessing high technical standards and leads to strengthening and enhancing research networks.

### International Partners for Research Cooperation Agreements

- French Alternative Energies and Atomic Energy Commission (CEA)
- Électricité de France (EDF)
- Studiecentrum voor Kernenergie • Centre d'Etude de l'Énergie Nucléaire (SCK • CEN), BE
- Korea Electric Power Corporation Research Institute (KEPRI)
- Korea Electrotechnology Research Institute (KERI)
- Korea Hydro & Nuclear Power Co., Ltd. Central Research Institute (KHNP-CRI)
- Taiwan Power Company (TPC)
- Electric Power Research Institute (EPRI), US
- Southwest Research Institute (SwRI), US
- Organization for Economic Co-operation and Development / Nuclear Energy Agency (OECD/NEA)

## Research History

● Establishment of CRIEPI (1951)

● Commencement of operation of Japan's first commercial nuclear power plant (1966)

● Oil crisis (1973, 1979)

● Accident at Three Mile Island Nuclear Generating Station (1979)

● Accident at Chernobyl Nuclear Power Plant (1986)

● Adoption of Kyoto Protocol (1997)

● JCO criticality accident (1999)

● Major blackout across North America (2003)

● Accident at Fukushima Daiichi Nuclear Power Station (2011)

● Adoption of Paris Agreement (2015)

● Major blackout in Hokkaido (2018)

1950s ▶ 1960s

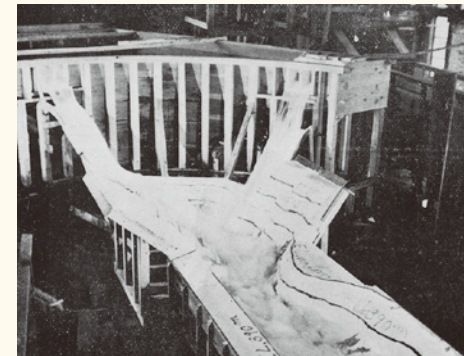
1970s ▶ 1980s

1990s ▶ 2000s

2010s ▶

### 1950s

- Developed high power transmission technology
- Streamlined designs for arched and gravity dams

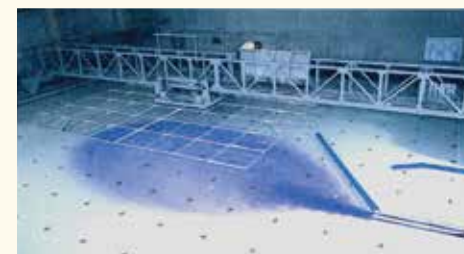


Model testing for spillway

- Analyzed and examined issues with electric power system operation
- Developed technologies for applying crude oil in thermal power generation

### 1960s

- Promoted electrification of agricultural technology
- Developed prediction methods for diffusion of warm-water discharged from thermal and nuclear power plants



Warm-water diffusion testing

- Provided technological assistance for building nuclear power plants
- Developed "CRIEPI Short-Term Macro-Econometric Model"

### 1970s

- Researched sophistication of lightning-protection designs for electric power facilities
- Conducted research aimed at modernization of power distribution systems
- Advanced evaluation methods of aseismic performance at nuclear power plants



Forced vibration test inside nuclear power plant building

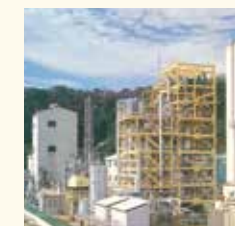
- Developed diffusion prediction method and environmental impact assessment method for stack gas from thermal power plants

### 1980s

- Researched transport, storage and disposal of radioactive waste
- Developed ultra high voltage (UHV) AC transmission technology



UHV AC test transmission lines

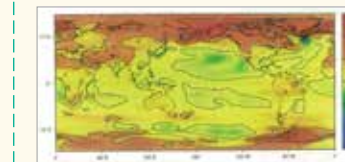


Coal gasifier

- Developed integrated coal gasification combined cycle (IGCC) power generation technology
- Conducted research on human factors

### 1990s

- Elevated precision of fault activity assessment methods to high levels
- Researched global warming projection and mitigation



Changes in global mean surface temperature caused by doubling of CO<sub>2</sub> concentration

- Studied biological effects of low-dose radiation
- Developed residential CO<sub>2</sub> heat pump water heater



Performance evaluation testing for prototype of CO<sub>2</sub> heat pump

### 2000s

- Sophisticated technology of analysis for stable operation of electric power systems
- Researched life management for aging electric power transmission and distribution facilities
- Researched materials for plant life management of nuclear reactors



Crack propagation testing for structural materials for nuclear reactors

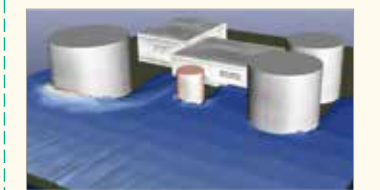
- Enhanced quality of next-generation power semiconductor device to high levels



Fabrication of SiC semiconductor device materials

### 2010s

- Conducted research aimed at improving safety and reducing risk in order to continue using nuclear power



Tsunami numerical simulation in power plant site



Testing facility for three-dimensional thermal hydraulics in light-water reactors

- Conducted research associated with electricity system reform and energy policy
- Conducted research aimed at promoting electrification and improving customer satisfaction

# Locations

## ● Otemachi Area

- Internal Audit Office
- Head Office
- Socio-Economic Research Center
- Nuclear Risk Research Center

Otemachi Bldg. 7F, 1-6-1 Otemachi,  
Chiyoda-ku, Tokyo 100-8126  
Phone: +81-3-3201-6601

## ● Yokosuka Area

- Energy Transformation Research Laboratory
- Grid Innovation Research Laboratory

2-6-1 Nagasaka, Yokosuka-shi,  
Kanagawa 240-0196  
Phone: +81-46-856-2121

## ● Abiko Area

- Sustainable System Research Laboratory

1646 Abiko, Abiko-shi,  
Chiba 270-1194  
Phone: +81-4-7182-1181

## ● Komae Area

2-11-1 Iwadokita, Komae-shi,  
Tokyo 201-8511  
Phone: +81-3-3480-2111

## ● Akagi Testing Center

2567 Naegashima-machi, Maebashi-shi,  
Gunma 371-0241  
Phone: +81-27-283-2721

## ● Shiobara Testing Yard

1033 Sekiya, Nasushiobara-shi,  
Tochigi 329-2801  
Phone: +81-287-35-2048



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<https://criepi.denken.or.jp/en/>

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For details, please visit our website.

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